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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/712,839

11/12/2003

Jong Sik Paek

GK0005

9506

7590

11/29/2005

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EXAMINER

WEISS, HOWARD

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 11/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/712,839

Applicant(s)

PAEK ET AL.

Examiner

Howard Weiss

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 22-25 ~~is/are~~ are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 22-25 ~~is/are~~ are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Attorney's Docket Number: GK0005

Filing Date: 11/12/03

Continuing Data: none

Claimed Foreign Priority Date: none

Applicant(s): Paek et al. (Kim, Seo)

Examiner: Howard Weiss

Claim Objections

1. Claim 23 recites the limitation "the solder balls" in Line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1 to 15 and 22 to 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boon et al. (U.S. Patent No. 6,882,021) and Tu et al. (U.S. Patent No. 6,559,539) and Komiyama (U.S. Patent No. 6,329,708).

Boon et al. show most aspects of the instant invention (e.g. Figures 1 and 4) including:

- an image sensor die **20** with a photo sensing surface **30** and bond pads **24** and a non-photo sensing surface **28**
- a window **40**
- electrically conductive patterns **60a,60b,61** extending over said sides of said die and connecting solder balls **72** to said bond pads via holes **70**
- an encapsulant **80** encapsulating said conductive patterns and said bond pad but not covering said photo sensing surface

Boon et al. do not show an insulative layer extending over a side surface of side sensor die and attached to the non-photo sensing surface via an adhesive, the window explicitly made of glass, the memory die attached to the non-photo sensing surface, conductive bumps interposed between the memory die and conductive patterns and the first curved portion having a curvature on the side of said image sensor die and second memory die attached as claimed.

Tu et al. teach (e.g. Figure 3) to attached a memory die **22** to the non-photo sensing surface of an image sensor die **26** and to put conductive bumps **36** interposed between the memory die and conductive patterns **16** to lower costs (Column 3 Line 64 to Column 4 Line 11). It would have been obvious to a person of ordinary skill in the art at the time of invention to attached a memory die to the non-photo sensing surface of an image sensor die and to put conductive bumps interposed between the memory die and conductive patterns as taught by Tu et al. in the device of Boon et al. to lower costs.

Komiyama teaches (e.g. Figures 7 to 9) to have an insulative layer **609a** extending over a side surface of side sensor die **601a** and attached to the non-photo sensing surface via an adhesive **607a** and a first curved portion **608a** having a curvature on the side of said image sensor die **601a** and first and second memory dies **601b**

attached as claimed to reduce manufacturing costs (Column 8 Lines 3 to 11). (Although not shown, other memory dies could be attached via holes **633b**; see *ibid*). It would have been obvious to a person of ordinary skill in the art at the time of invention to have an insulative layer extending over a side surface of side sensor die and attached to the non-photo sensing surface via an adhesive and a first curved portion having a curvature on the side of said image sensor die and first and second memory dies attached as claimed as taught by Komiyama in the device of Boon et al. and Tu et al. to reduce manufacturing costs. Additionally, it is common and therefore obvious, to use glass as window material.

Response to Arguments

4. Applicant's arguments with respect to Claims 1 to 15 and 22 to 25 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at **866-217-9197** (toll-free).
6. Paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources.

Art Unit: 2814

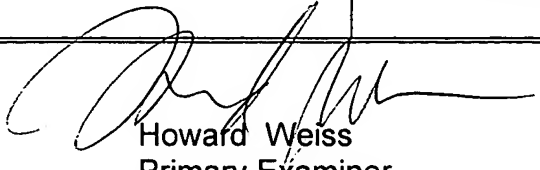
Applicants are referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.

7. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(571) 273-8300**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 7:00 AM to 3:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705.

9. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/680	thru 11/15/05
Other Documentation: none	
Electronic Database(s): EAST	thru 11/15/05

HW/hw
15 November 2005


Howard Weiss
Primary Examiner
Art Unit 2814